Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
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Wireless E9-1-1 Phase II Automatic Location Identification Requirements	)	**CC Docket No. 94-102**
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To the Commission:

COMMENT BY U.S. WIRELESS CORPORATION REGARDING REQUESTS FOR WAIVER OF WIRELESS E9-1-1 PHASE II AUTOMATIC LOCATION IDENTIFICATION REQUIRMENTS

I. BACKGROUND

The Commission's Report and Order released July 26, 1996 requires that covered wireless carriers deploy Automatic Location Identification (ALI) as part of Enhanced 9-1-1 (E9-1-1) service beginning October 1, 2001, provided certain conditions are met. Section 20.18(e) of the Commission's Rules requires that covered carriers provide the location of all 9-1-1 calls by longitude and latitude with an accuracy of 125 meters or less, using Root Mean Square (RMS) techniques.

On December 24, 1998, the Commission's Wireless Telecommunications Bureau released a public notice outlining a filing schedule for requests for waivers of Section 20.18(e) by those carriers interested in handset-based approaches to the Phase II ALI requirements. Various parties have filed requests for waivers and other documents in response to the public notice.

On June 1, 1999, the Commission issued a public notice[1] requesting "targeted comment on Wireless E9-1-1 Phase II Automatic Location Identification Requirements," specifically focusing on the following issues:

(1) whether to adopt standards for handset approaches similar to those outlined in two specific proposals (by SnapTrack and APCO, respectively) submitted in the proceeding;

(2) how specifically to handle the issues of roaming and handset turnover; and

(3) whether the Commission should clarify or modify the methodology for determining ALI accuracy under Phase II.

II. INTRODUCTION TO THE SUBMITTER, U.S. WIRELESS CORPORATION

U.S. Wireless Corporation is a developer and provider of wireless caller-location solutions and services. The Company's caller-location system, the RadioCamera™, is a network-based solution that uses U.S. Wireless' proprietary Location Fingerprinting™ (LF) technology. The RadioCamera locates and tracks wireless callers, and can thereby enable wireless carriers to comply with Phase II of the Commission's "E9-1-1 Mandate."

Contrary to generalizations often made regarding network-based systems, the RadioCamera system and Location Fingerprinting technology does not rely on triangulation, and is able to locate wireless callers from a single point of reference or base station.

U.S. Wireless has signed testing and product evaluation agreements with wireless carriers including Bell Atlantic Mobile, Western Wireless, GTE and Nextel Communications. These arrangements include current deployments and ongoing field trials in Oakland, California; Billings, Montana and the Baltimore/Washington DC area. The RadioCamera is successfully operating in a variety of environments including urban, rural and suburban, and test results at these sites have met and exceeded the FCC mandated requirements for Phase II E9-1-1.

The current deployment in Billings, Montana is an "end-to-end" E9-1-1 trial with continuous caller location. It is a cooperative effort involving the State of Montana, the local Billings 9-1-1 center and six leading telecommunications organizations. Participants in the field

[1] Public Notice, DA 99-1049, June 1, 1999; "Wireless Telecommunications Bureau Requests Targeted Comment on Wireless E911 Phase II Automatic Location Identification Requirements" CC Docket No. 94-102

trial include U.S. Wireless Corporation, US WEST Corporation, XYPOINT, Nortel Networks, Western Wireless and Williams Communications Solutions.[2]

U.S. Wireless Corporation intends to build a nation-wide network of wireless caller-location systems, which it will then operate as a service bureau. This nation-wide deployment is planned for completion prior to October 2001, to facilitate compliance with Phase II E9-1-1.

III. PUBLIC EXPECTATIONS

It has long been recognized that personal safety is a primary selling point for the wireless industry. Until recently however, many wireless subscribers did not realize that when they made a call for emergency assistance from a wireless phone, their location information was not immediately available to the dispatcher. Today, with increasing publicity surrounding the subject of Enhanced 9-1-1, informed wireless subscribers understand that ALI does not currently exist for wireless. Based on their awareness of the E9-1-1 Mandate, the same subscribers fully expect that when they call 9-1-1 after October 1, 2001, their location information will be automatically available to the dispatchers.

IV. THE ISSUE OF WAIVERS

The Commission has expressed its concern that "the effect of Section 20.18(e) might not be technologically and competitively neutral for some technologies that might be used to provide ALI, particularly handset-based technologies such as those using the Global Positioning Satellite (GPS) system." Accordingly, the Commission has indicated a "willingness to consider such issues either in the E911 rulemaking or in response to requests for waivers." [3]

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[2] The Montana field trial is evaluating an end-to-end wireless E9-1-1 system. The first phase of testing has demonstrated the system's ability to continuously locate multiple wireless 9-1-1 calls originating within the greater Billings, Montana area. During this phase the system identified a caller's phone number, location coordinates and nearest street address. The information was then sent to the appropriate Public Safety Answering Point (PSAP), where it was displayed on an electronic map on an operator's workstation. The RadioCamera continuously updated the location information, allowing the PSAP to monitor the caller's location throughout the call.

[3] Public Notice, DA 99-1049, June 1, 1999; "Wireless Telecommunications Bureau Requests Targeted Comment on Wireless E911 Phase II Automatic Location Identification Requirements" CC Docket No. 94-102

The Issue of Neutrality

U.S. Wireless maintains that Section 20.18(e) is *already* technologically and competitively neutral, in that it does not mandate or suggest that any specific technology be deployed to meet the requirements. It is noted that the Rule was established in 1996, at which time various vendors began developing their respective solutions. Now, three years later, proponents of handset-based technologies argue that the Rule places GPS systems at a disadvantage, since GPS technology is not ready for deployment, and therefore cannot compete to satisfy the requirements of the October 2001 deadline. The fact that the Commission is considering granting waivers based on carriers' professed intention of implementing handset-based solutions jeopardizes the Mandate's existing technological and competitive neutrality. Specifying criterion for waivers based on the expressed intention of pursuing an immature handset-based technology entices carriers to pursue handset-based solutions, encouraging delayed investment of capital and resources necessary to meet the mandated deadline of October 2001. Far from creating a "level playing field," the prospect of waivers serves to tilt the field in favor of handset-based technology.

Network-based solutions are currently deployed, functioning and available, while GPS handset-based technology is immature, unproven and unavailable. Proponents of handset-based technologies assert that GPS technology holds future promise for E9-1-1 applications, but to delay Phase II implementation based on this potential would be contrary to public interest, delaying the implementation of currently available life-saving technology. Following deployment, it is likely that ALI technologies will continue to develop, as is true for technological innovation in general. However, the promise of future technological evolution does not justify inaction and delayed implementation.

How Available is GPS Handset-Based Technology?

At this time, there is not a commercially available handset with integrated GPS. It is noted that there are no guarantees regarding the future availability of GPS-enabled handsets, and no handset manufacturers have publicly announced scheduled development of such a product. Furthermore, claims made regarding the accuracy and promise of GPS technology are based on tests, which do not use actual GPS-integrated handsets.

GPS: Areas of Concern

There is a plethora of concerns surrounding the ability of GPS handset-enabled technology to satisfy the requirements of E9-1-1 Phase II:

(1) Handset availability: As mentioned previously, integrated GPS handsets have not yet been developed; to date, only prototype experimental trials have been performed, using equipment in which the GPS technology was not integrated into the handset.

(2) Networks: Large-scale network testing has not been demonstrated.

(3) Standards: All GPS solutions must agree on a single standard to permit interoperability between networks deploying different GPS solutions (GPS roaming). To date, such a standard has not been agreed upon.

(4) Yield: Handset-based technologies have yet to demonstrate high yield percentages, particularly in dense urban environments lacking direct line of sight to multiple GPS satellites.

(5) Penetration: Complete coverage of all wireless phones will not be achieved using a GPS handset-based solution, and any "phased-in" approach would result in an "under class" of wireless users without ALI benefits. Conversely, currently available network-based solutions can provide service for all users, regardless of their ability to purchase advanced, expensive service plans.

- GPS solutions are incompatible with the analog AMPS standard: Despite the industry's migration to digital standards, the majority of wireless phones in the US market are currently analog. Concurrent with the digital migration is growing popularity of "dual-mode" wireless phones (analog + digital).
- According to manufacturers, the "normal" life span of a handset is four to five years. Thus, if ALI handsets are available in 2001, there will not be wide spread deployment until 2005-2006. It is also important to consider that GPS integration may actually *discourage* handset replacement by creating a heavier, more expensive handset with shorter battery life in a market where small, inexpensive handsets and long battery life are highly valued.
- "Glove box" phones, often specifically purchased for safety purposes, will not be covered. Some of these phone owners may not even have service plans.

(6) Compliance: Since GPS handset-based technology is still unproven and unavailable, compliance with Phase II Rules is not within the control of carriers requesting

waivers to implement handset-based solutions. This makes the waivers very attractive to carriers, as it removes the burden of responsibility for compliance. Assuming waivers are granted and GPS handset-based solutions are pursued, network-based solutions will not be pursued in those cases. If a commercially viable GPS solution is still unavailable in 2001, some networks will be completely ALI incapable. What motivates compliance in this scenario?

V. "TARGETED COMMENT"

In response to the Commission's request for "targeted comment" on E9-1-1 Phase II ALI requirements[4], the following analysis and suggestions are respectfully submitted:

(1) Should the Commission adopt standards for handset approaches similar to those outlined in two specific proposals (by SnapTrack and APCO, respectively) submitted in the proceeding?

(In the applications for waivers, early deployment and increased accuracy was a common theme.)

The suggestions cited above are worthy of consideration only under the assumption that network-based caller-location systems are incapable of achieving accuracy "substantially better" (i.e. 90 meters) than the current Phase II requirement, and public safety would therefore benefit from a relaxing of Commission Rules to benefit developing handset-based technologies. In fact, network-based systems are currently able to substantially exceed 125-meter accuracy using the circular error probability method of calculation. In published test results, U.S. Wireless Corporation's network-based system has consistently exceeded 90-meter accuracy 67% of the time (CEP) in varied environments, from dense urban to sparse rural. It is also important to note that commonly reported accuracy results for handset-based technology have reflected the performance of experimental prototype equipment that was not integrated into actual handsets.

Regarding the suggested stipulation of early deployment of location-capable handsets, both SnapTrack and APCO suggest *beginning* deployment no later than January 1, 2001. This suggestion assumes commercial availability of such handsets by that date, and as previously

[4] Public Notice, DA 99-1049, June 1, 1999; "Wireless Telecommunications Bureau Requests Targeted Comment on Wireless E911 Phase II Automatic Location Identification Requirements" CC Docket No. 94-102

noted, such availability remains pure conjecture at this time. To consider granting waivers based on partial early deployment is to dilute the strength of the Commission Rules based on conjectural benefits of early deployment. Granted, early deployment would be a boon to the safety and security of the public, but *partial* early deployment is little more than a symbolic gesture of apology for failure to provide the public with *universal* ALI coverage. Again, as noted previously, this would also establish "user classes," in which the privileged location-capable handset owners would enjoy the additional security of Phase II E9-1-1, while the general public enjoys no such benefit.

(2) How should the issues of roaming and handset turnover be handled?

Any ALI system that does not provide coverage for one hundred percent of the 9-1-1 calls in a network should be deemed an inappropriate solution for Phase II E9-1-1. To rely on market forces for handset turnover would be to delay full public benefit of ALI for at least four years beyond the Commission's established deadline. Additionally, GPS-enabled handsets may never be capable of providing ALI for analog handsets, or for dual-mode handsets operating in analog mode.

A network-based solution is the only solution in which roaming is not an issue. The issue of roamer compatibility for handset-based solutions has yet to be satisfactorily addressed by equipment manufacturers.

- A GPS-enabled phone roaming into a "GPS network" may not be ALI-functional, unless a standard for sending location information is developed and agreed upon.
- A non-GPS-enabled phone roaming into a "GPS network" would not be covered.
- An analog (or dual-mode phone operating in analog mode) will not be covered when roaming into a "GPS network."
- On the other hand, *all phones,* roaming or otherwise, receive the benefits of ALI in a network-based ALI system.

(3) Should the Commission clarify or modify the methodology for determining ALI accuracy under Phase II?

The use of CEP (Circular Error Probability) may reflect the performance of an ALI system more appropriately than the use of RMS (Root Mean Square) methodology. It may also prove beneficial to consider all of the following aspects of an ALI system when evaluating overall system performance:

1. Accuracy: Regardless of methodology used, are handset-based approaches truly more accurate than network-based solutions? With network-based systems currently able to locate callers with 90-meter accuracy, a claim of accuracy within 90-meters does not demonstrate superior accuracy by handset-based technologies. Also, in assessing the level of accuracy demonstrated by a GPS-enabled handset, there needs to be a method for including a "no fix" (unable to determine location) reading in the accuracy assessment.
2. Latency: Is the technology capable of Phase II routing? Is Phase II routing capability required? Current GPS systems have very high latency for "first fix" (over six seconds), which will result in long delays in routing, which in turn will result in 9-1-1 caller hang-ups. The latency may be even longer for GPS handsets roaming into networks utilizing different types of GPS systems.
3. Yield: What is an acceptable yield for an ALI system? Is 95% acceptable?

VI. CONCLUSION

U.S. Wireless Corporation respectfully urges the Commission to remain steadfast in enforcing the original terms of the Enhanced 9-1-1 Phase II requirements. The spirit of the Mandate serves to benefit the general public by increasing levels of personal safety and security, and to facilitate the work of the Public Safety community by providing the tools to more effectively respond to crisis situations. The Commission's desire to remain technologically and competitively neutral in enforcing its rules is laudable and necessary, but care must be taken to ensure that by amending or revising the Rules, the intended neutrality is not reversed. In light of the preceding analysis, it is respectfully requested that the Commission evaluate the neutrality of the Rules at present versus changing the Rules to benefit the development of one particular technology.

It is questionable that the very aspect of handset-based technology which makes it unsuitable for the purposes of the Mandate is the same aspect cited as a cornerstone of the arguments used to rationalize the issuance of waivers: *The technology is not available for deployment, and cannot achieve 100% coverage within any network.*

The Mandate does not discriminate based on preferred technology. Any technology capable of fulfilling the Rules is able to compete for market share. It is suggested that available network-based solutions be deployed on time. If future forces of market needs and technological development create a supplemental solution, such technology will be implemented at that future time.

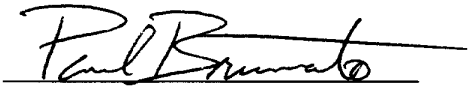
Should the Commission decide to continue investigating the option of granting waivers, it is suggested that the system performance of suggested handset-based technologies be thoroughly evaluated to ensure that they are capable of achieving predetermined performance criterion, as discussed previously. It is further suggested that the issue of roaming be resolved to insure that ALI is available for all calls for emergency assistance within a given network. If waivers are granted and the scheduled minimal deployment standards are not met due to product unavailability or unsuitability, it is strongly recommended that immediate compliance be mandated, requiring the utilization of existing solutions. It is respectfully recommended that the following points be considered for inclusion in stipulated requirements for waiver consideration:

- Carriers requesting waiver must demonstrate availability of test results for handsets with *integrated* ALI capability that meet certain minimum performance standards (as discussed previously).
- Carriers must demonstrate a commitment by handset manufacturers, clearly outlining a manufacturing and deployment schedule for handsets with integrated ALI capability.
- A system must be deployed to accommodate analog (and dual mode, operating as analog), as well as digital handsets.
- If the predetermined deployment schedule and performance requirements are not met, subscribers must be provided ALI benefits using existing (network-based) solutions.

The technology to implement Phase II E9-1-1 exists today. Let us not set back the implementation of life-saving technology for an additional five years. If waivers are denied, existing solutions will be implemented and developing solutions will continue to develop. On the other hand, if waivers are granted, the potential loss will not be time or money, but the unnecessary loss of human lives.

Respectfully Submitted,

U.S. Wireless Corporation

By: 

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